Precision Cooling
For *Business-Critical Continuity™*

Ensuring Network Availability With Mission-Critical Cooling Technologies

Precision Control Of Room Environment For Computers, Communications Systems And Other Sensitive Electronic Equipment

EMERSON™
Network Power

As The Temperature Rises — So Does Your Risk

Every operation of your company depends upon the instant around-the-clock availability of computers, servers and other electronic systems. If they aren't working, neither is your company. Unfortunately, every piece of IT equipment your company possesses produces heat.

And if you don't get rid of the heat, you are going to have problems. The first step in taking control of this situation is to understand the threats to your system reliability — and exactly what you can do about them.

You Face Many Challenges In The Pursuit Of Business Continuity But There Are Real Solutions

Mission-Critical Cooling Provides Protection Under All Conditions
Yes, computers have changed — but the threats to their operation are as real as ever. An air conditioning system that maintains the temperature and humidity at the proper levels in your critical facility is an absolute necessity for the viability of your business.

Mission-Critical Systems Keep Moisture And Air Cleanliness Right Where They Need To Be
Ordinary building air conditioning and heating systems are designed to keep people comfortable. Computers and other sensitive electronics require a system that provides humidity control to meet equipment specifications — and air filtration designed to keep airborne particles from causing problems.

Because Every Facility Is Unique, Mission-Critical Systems Are Designed to Meet The Cooling Needs Of Any Critical Space
A mission-critical cooling system can be engineered to match just about any type or size of facility. There are downflow systems for raised floor facilities and upflow units where the floors are not raised. Supplemental systems can be used where equipment is tightly packed in racks. Compact models are ideal for small or remote facilities.

Mission-Critical Cooling Systems Are Engineered To Get The Most From Every Energy Dollar
Energy efficiency is no longer just an option for users of air conditioning. Today's systems offer a choice of compressor types, micro-processor controls and other optional features designed to reduce power consumption and maximize energy savings.

Mission-Critical Systems Are Designed To Operate Year-Round
Because most critical computing and communications facilities function on a 24 x 7 basis — so must the environmental equipment that is protecting it. Mission-critical cooling is designed to run around-the-clock, no matter what the outside weather conditions.

INFRASTRUCTURE MANAGEMENT
Improving performance of the IT infrastructure and environment
ECO AVAILABILITY
Balancing high levels of availability and efficiency
FLEX CAPACITY
Adapting to IT changes for continuous optimization and design flexibility
HIGH DENSITY
Delivering architectures from 10–60 kW/Rack to minimize space and cost

Efficiency Without Compromise®

Optimizing The Data Center Infrastructure To Reduce Cost And Deliver High Availability

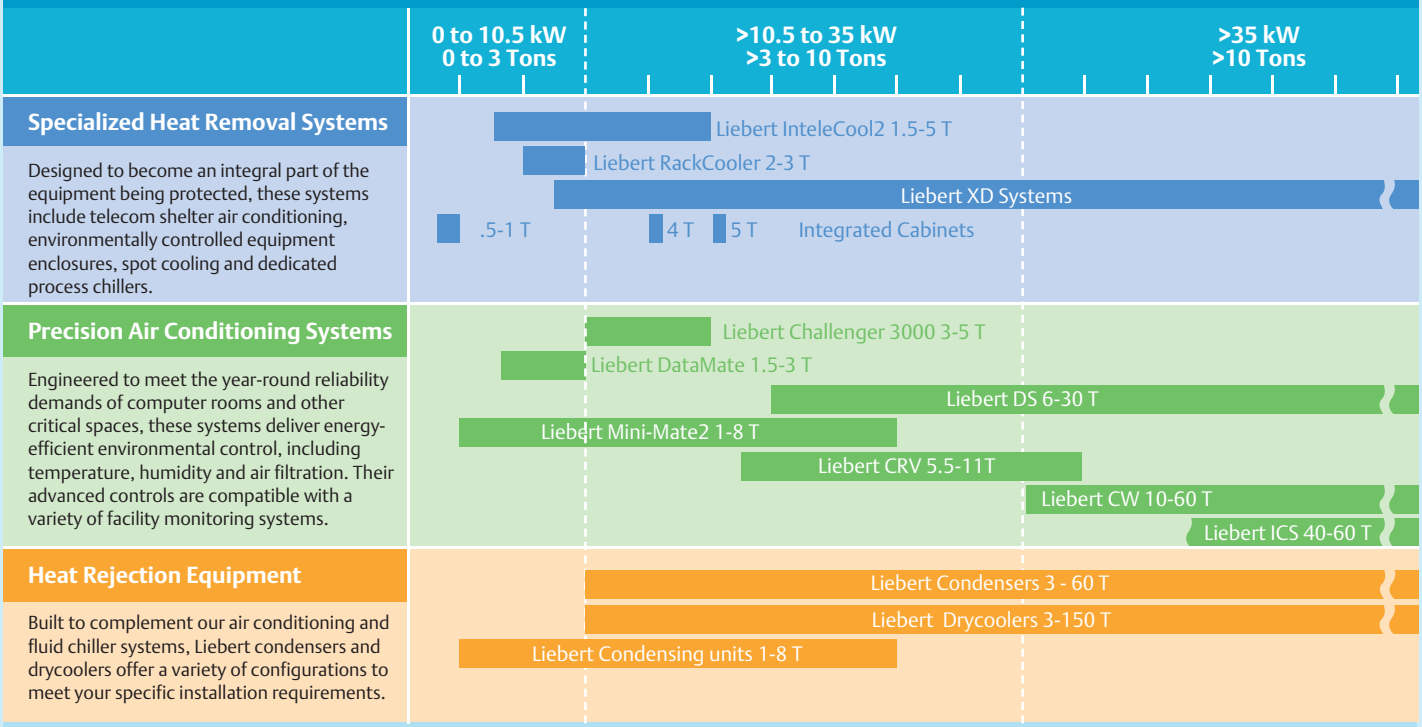
True data center efficiency is not limited to lower energy usage — it must encompass efficiency across all aspects of design, operation and management. Focusing purely on energy efficiency can result in compromising the efficiency or reliability of other critical IT operations. Emerson Network Power delivers Efficiency Without Compromise™ by identifying and improving on areas of opportunity to create both energy savings and improved operation and workflow.

Efficiency Without Compromise provides a path to optimize data center infrastructure around design, operating and management efficiencies – while maintaining or improving availability. This is achieved through the proper selection and utilization of cooling, power and monitoring technologies, supported by key services and local expertise.

The Widest Range Of Products Gives You An Infinite Range Of Solutions

From high-capacity units such as the Liebert DS — the standard of the industry — to compact above-ceiling systems like the Liebert Mini-Mate2™, there is a Liebert system designed to cool and protect your critical computing systems. We make the industry's widest range of mission-critical environmental controls, including perimeter, row-based, and ceiling-installed precision cooling systems, extreme density systems, and heat rejection systems in capacities from 1 to more than 65 tons (3-210 kW). Systems are available with a choice of cooling methods, including chilled water, air-cooled and water/glycol-cooled models, as well as ultra energy efficient GLYCOOL™ and Dual-Cool configurations.

The Liebert Range of Precision Cooling Solutions


0 to 10.5 kW
0 to 3 Tons
>10.5 to 35 kW
>3 to 10 Tons
>35 kW
>10 Tons
Specialized Heat Removal Systems
Designed to become an integral part of the equipment being protected, these systems include telecom shelter air conditioning, environmentally controlled equipment enclosures, spot cooling and dedicated process chillers.
Liebert InteleCool2 1.5-5 T
Liebert RackCooler 2-3 T
Liebert XD Systems
.5-1 T
4 T
5 T
Integrated Cabinets
Precision Air Conditioning Systems
Engineered to meet the year-round reliability demands of computer rooms and other critical spaces, these systems deliver energy-efficient environmental control, including temperature, humidity and air filtration. Their advanced controls are compatible with a variety of facility monitoring systems.
Liebert Challenger 3000 3-5 T
Liebert DataMate 1.5-3 T
Liebert DS 6-30 T
Liebert Mini-Mate2 1-8 T
Liebert CRV 5.5-11T
Liebert CW 10-60 T
Liebert ICS 40-60 T
Heat Rejection Equipment
Built to complement our air conditioning and fluid chiller systems, Liebert condensers and drycoolers offer a variety of configurations to meet your specific installation requirements.
Liebert Condensers 3 - 60 T
Liebert Drycoolers 3-150 T
Liebert Condensing units 1-8 T

You Need To Start With The Right Kind Of Cooling

Some operations may be tempted to utilize standard comfort cooling systems to save money or to avoid using additional floorspace within their facility. But while these moves may provide some benefits in the short term — they must be balanced against the cost of potential downtime and equipment damage caused by serious overheating, as well as the risk of financial loss.

Why Comfort Air Conditioning Should Make You Uncomfortable

Standard building air conditioning is designed for one thing: to keep people comfortable. In most cases, this is done 8-12 hours each day, five days a week and only during the warmest months. These units are simply not built to handle the 24 hour-a-day operation associated with computer rooms and communications facilities.

The Protection Never Stops

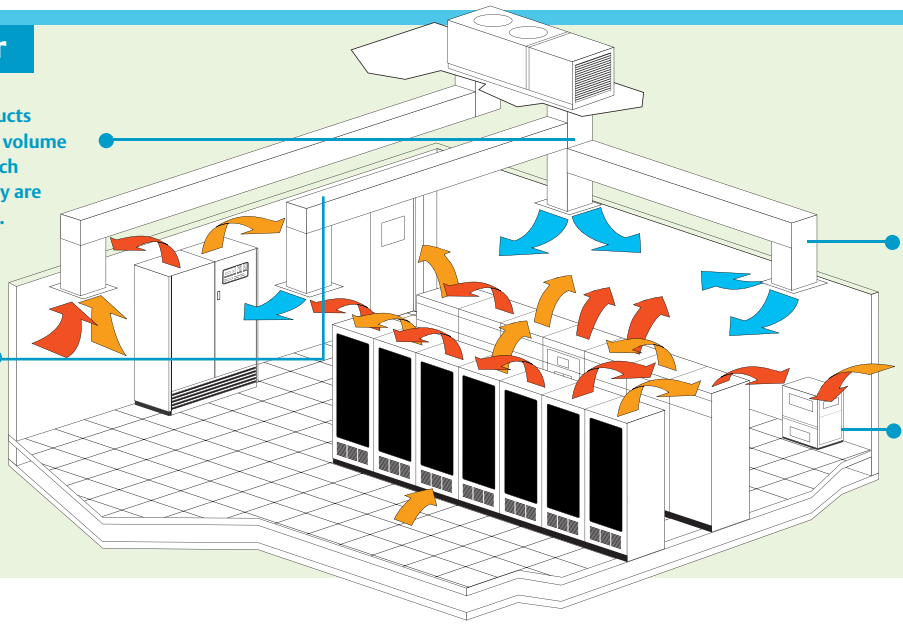
Mission-critical cooling systems are designed to run the same hours as your network — continuously, year in and year out, around the clock. These systems are specifically designed to maintain both temperature and humidity levels to equipment manufacturers' specifications, which are several times more stringent than those designed for the human body.

Removing Heat Without Removing The Humidity

The biggest problem with ordinary air conditioning systems is they are designed for the comfort of people — not the protection of computer-based electronic systems. Unlike people, computers generate dry (also called sensible) heat, but not humidity.

With a large percentage of their total capacity devoted to the removal of moisture, comfort systems can lower room humidity far below acceptable standards for electronic equipment — and they have no provisions for adding moisture. To correct this situation, precision air conditioning systems typically have a high ratio of sensible-to-total cooling capacity to remove heat from the air. This allows for much lower operating costs since the type of cooling is matched to the load. These units also use integrated humidification systems to provide the necessary level of moisture control.

Comfort Air


Using rigid, overhead ducts provides insufficient air volume (350-400 CFM/Ton) which results in hot spots. They are also difficult to relocate.
Minimal air filtration is typically provided with comfort systems.
Comfort systems can over-dry room air because of their lower Sensible Heat Ratio. They typically do not provide integral humidity control.
Using separate humidification systems, not controlled by the cooling system, can waste energy and reduce the stability of the environment.

What Makes A Mission-Critical Air Conditioning System So Different?

There are several key areas that differentiate mission-critical cooling from ordinary comfort air conditioning systems. Each of these performance criteria has a major impact on the proper environmental protection of your critical facility.

Temperature And Humidity Control

Mission-Critical Systems are specifically designed to handle the heat loads generated by electronic equipment. They utilize fast-response microprocessor control systems to adjust quickly to changing conditions within the room, while providing you with complete supervision of temperature and humidity at all times. Liebert lets you choose from several humidification methods including integral infrared and steam generation units.

Air Flow Management

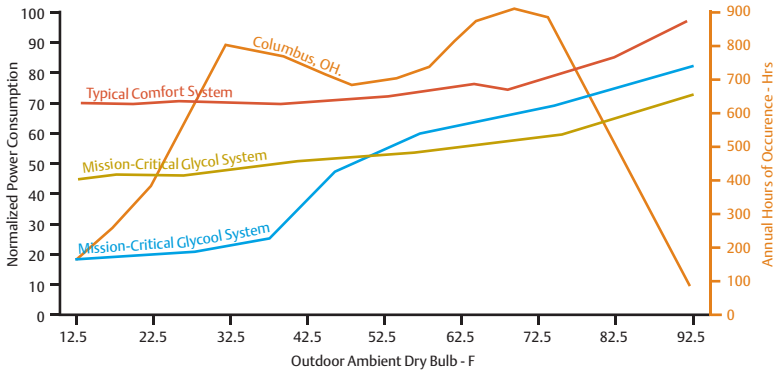
Providing the proper volume of air to the specific location in a data center is as important as the temperature control. Mission-Critical Systems are designed to handle a wide range of static pressures within the duct work or under floor plenium to address this important requirement.

Operating Efficiency

The higher Sensitive Heat Ratio (SHR) of Mission-Critical Systems results in lower energy operating costs vs. comfort systems. Four-Step, GLYCOOL™ and Dual-Cool options offer even more energy efficiency. These enhancements increase the performance level of the system and more closely track the cooling load of your critical space.

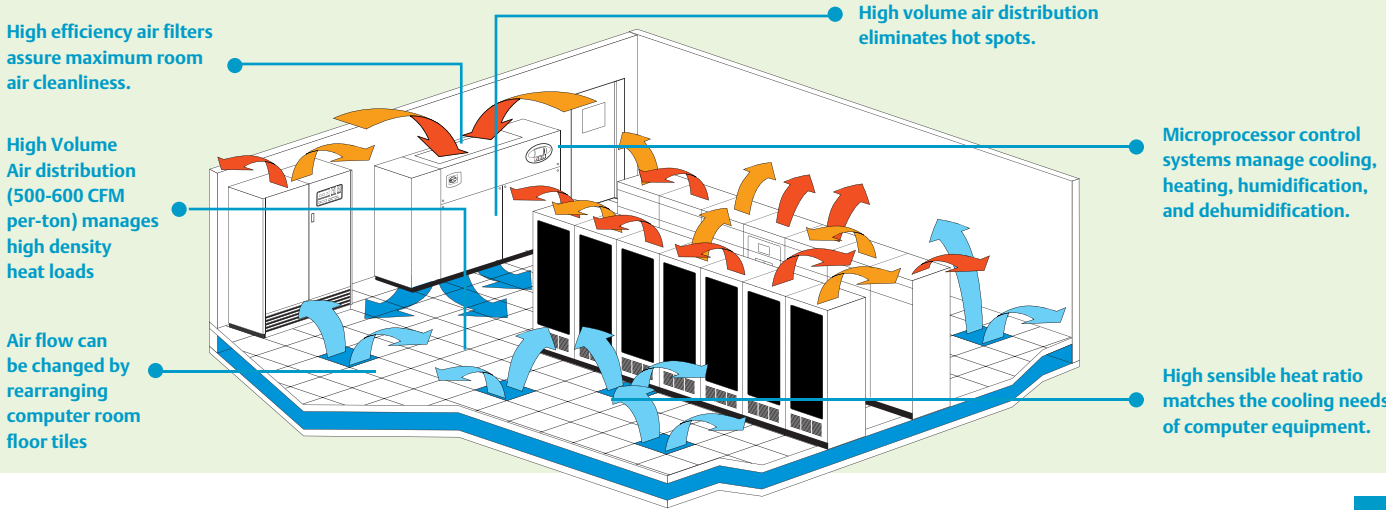
	Required Attributes	Mission-Critical Air Conditioning Systems	Typical Comfort Air Conditioning Systems
Design Considerations For Any Computer Room Environment	High sensible heat ratio to provide high cooling capacity/minimum dehumidification	"Computer" environments produce high heat/no humidity	"People" produce an equal amount of heat and humidity
	High-efficiency air filtration	Typical MERV rating of 5	Minimum MERV rating of 8
	Humidity control	Integral with control system	Typically an add-on system with separate controls
	Year-round operation	Positive operation with outside temperatures as low as -30° F	Typically used May to October
Additional Design Considerations Required For High Density Environments	High density loads require more room air changes	1 per minute; 2 per minute at 200w/sq. ft.	3-4 per hour
	More tons of cooling per square foot	One ton of cooling for every 10- 60 square feet of space	One ton of cooling for every 200-400 square feet of space
	Control staging	Fast-acting, multiple cooling stages maintain tight control	Slow response systems, typically only on/off control

Full System Power Comparison - 100% Load



Mission-critical environmental control systems are designed to be much more energy efficient than their comfort air conditioning counterparts.

Mission-Critical Air


High efficiency air filters assure maximum room air cleanliness.
High volume air distribution eliminates hot spots.
High Volume Air distribution (500-600 CFM per-ton) manages high density heat loads
Microprocessor control systems manage cooling, heating, humidification, and dehumidification.
Air flow can be changed by rearranging computer room floor tiles
High sensible heat ratio matches the cooling needs of computer equipment.

Where Do You Need Mission-Critical Cooling Technology?

We have cooling solutions for any of the applications that are part of your mission-critical business operations.

Liebert has identified nine distinct zones or areas of application, found within many business operations, which have a requirement for mission-critical cooling technology. While these zones have similarities in the importance of their essential functions, they also have different needs for infrastructure protection — all of which can be met by Liebert solutions.

Data Centers — High availability data and network applications are the heart of your enterprise with blade servers and high-density racks that demand increased cooling protection.

Computer Rooms — Smaller-sized network and computer facilities, but equally essential to your operations.

Network Operations Centers — As networks expand and grow more complex, you need reliable and timely access to mission-critical infrastructure monitoring information long before problems arise.

Network Closets — Housing routers, switches, modems, cabling devices and numerous other communications components.

Mechanical Rooms — Home of your critical infrastructure, from the main electrical distribution system to your mission-critical networks.

Telecom Wireline / Wireless Sites — Indoor or outdoor spaces hosting cable, DSL and fiber optics to remote cell sites and enclosures.

Emergency Shelters — Emergency operations centers, 911 response emergency dispatch, police and fire facilities, medical facilities, public works operations and more.

Labs & Testing — Sensitive computers and equipment used for diagnosing patients, analyzing data, performing critical tests, and operating electronic tools and lab instruments.

Production — Smart factories backed by a complex electronic network, from computer-controlled machinery and processes to electronic sensors, business systems and utility equipment.

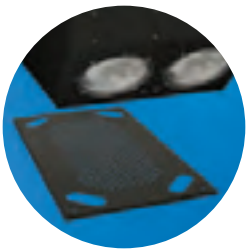
Solutions Oriented With The Spirit Of Innovation

Knurr, one of the world's largest suppliers of IT enclosures, offers a cabinet platform with unique features that solve problems faced by data center personnel.

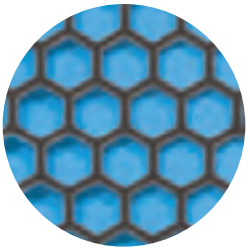
The Knurr Miracel is an innovative rack built on a unique extruded aluminum platform. It has been designed with the convenience of the user in mind:

Features Of Knurr Racks Include:

- The rugged aluminum frame is 50 pounds lighter than a comparable steel frame, making it easier for a user to move the rack by himself.
- EIA rails and PDU quick mounting rail are designed to mount and adjust easily.
- Tool-less cable management allows components to be mounted anywhere in the T slot in the cabinet frame, the EIA rail or the PDU rail — just insert with your fingers and rotate the piece clockwise 90°.



Roof pre-drilled for Liebert XDV accepts Liebert XDV with no need for drilling



83% Open area for improved airflow, highest in the industry

Lightweight aluminium frame makes the cabinet easier for a single person to move

Low profile casters allows 42u cabinet to roll through standard doorway

	Page Number	Data Centers	Computer Rooms	Network Closets	Mechanical Rooms	Telecom Wireline / Wireless Spaces	Emergency Shelters	Labs & Testing	Production
Precision Computer Cooling and Fluid-Cooling Systems									
Liebert InteleCool 2	8				■	■	■		
Liebert MCR, XDF, XDK	10			■		■	■	■	■
Liebert XD-Piping	12	■	■						
Liebert XDC Chiller	13	■	■						
Liebert XDO Overhead Cooling Module	13	■	■						
Liebert XDP Pumping Unit	13	■	■						
Liebert XDH In-the-row Cooling Module	13	■	■						
Liebert XDR-W (Rack Cooler)	13	■	■						
Liebert XDP-W (Coolant Pumping)	13	■	■						
Liebert XDV Vertical Top Cooling Module	13	■	■						
Liebert Mini-Mate 2	14	■	■	■	■	■	■	■	
Liebert DataMate	15	■	■	■		■		■	
Liebert Challenger 3000	16	■	■	■	■	■		■	■
Liebert CRV	18	■	■	■					
Liebert CW	20	■	■		■	■		■	■
Liebert DS	22	■	■		■	■		■	■
Liebert Condensers / Drycoolers	24	■	■	■	■	■		■	■
Liebert SmartAisle™	25	■	■			■	■		
Server and Client-side UPS Products				■			■	■	■
Facility-Wide Surge Suppression Products		■	■	■	■	■	■	■	■
Room/facility UPS and Power Conditioning Products		■	■	■		■		■	■
Racks and Enclosure Systems		■	■	■		■	■	■	■
Critical Monitoring and Connectivity Solutions	26	■	■	■	■	■	■	■	■
DC Power Products				■		■	■		

Flexible Outdoor Wallmount Cooling For Shelters And Other Structures

Even though they look the same on the outside, telecom shelters and other remote buildings have very different requirements.

That's why the versatile Liebert InteleCool 2 isn't just another shelter air conditioner...it's a custom-configured model that fits your exact needs and budget. Whether you need a bare-bones system at minimum cost...top-of-the-line dual units with remote monitoring... or anything in between — Liebert InteleCool 2 is designed with the flexibility to match the multiple protection needs of today's communications industry. Units are available in 1.5, 2, 3, 4, and 5 ton models, 50 or 60 Hz, to accommodate varied cooling requirements.

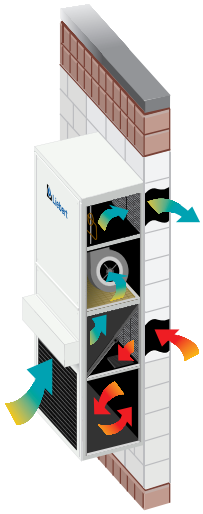
The Liebert InteleCool 2 System Is Perfect For Many Critical Applications:

- Communications switching facilities including cellular, radio paging, microwave/satellite earth stations and PCS services.
- Modular electronic equipment structures.
- Many other locations requiring cooling in a lightweight, efficient package.

Painted steel or aluminum cabinets
Heavy-duty double width blower
High efficiency R-407C scroll compressor
Optional Economizer with spring-return actuator
Choice of compressor on right or left side of unit
Copper-tube, aluminum fin coils

Liebert InteleCool2 Product Features Include:

- Self-contained design with all components enclosed in a painted steel or optional corrosion-resistant aluminum cabinet.
- Wide range of units available for year-round operation in ambient temperatures ranging from -20°F (-29°C) up to 125°F (52°C).
- Telecom Package incorporates popular options including low pressure switch, low pressure bypass and fan cycle control.
- Energy efficient scroll compressor operates quietly, which helps reduce the sound of units when shelters are located near neighbors.
- With right hand or left hand compressor location, the space used by a pair of units can be reduced while improving accessibility to the compressors.
- Outside air options include economizer for cooling using outside air and fresh air damper which allows a continuous amount of air to be introduced through the unit.
- Wired, piped, charged with refrigerant and fully factory tested as a system, to ensure easy, trouble-free installation and start-up.
- Allows field replacement/upgrades — 14 and 17.5 kW (4 and 5 ton) units available with 10.5 kW (3 ton) air openings.



Economizer Option

The Liebert InteleCool2 can be equipped with an economizer system that uses modulating dampers to draw in filtered, outside ambient air for cooling when the exterior temperature drops below a pre-set level. These outside air temperature settings are field adjustable. The economizer saves energy and reduces component wear.

Controls

For the highest levels of reliability — and to minimize site downtime — critical shelters can be equipped with two Liebert InteleCool 2 units and an autochangeover system that balances runtime and automatically switches from one unit to another unit if required.

High Density Rack Enclosures: Total Protection Wherever It's Needed

As a new generation of compact, heat producing IT switches and servers are deployed outside the large data center, there is an increasing need to manage escalating heat densities in network closets, computer rooms, and other locations with a small number of racks. These rack-based components must be protected with the same level of cooling, power and physical security support as a conventional computer room, but with the economies of scale and price in mind.

Liebert rack enclosure protection solutions bring together the full range of Liebert support systems into a single package. Depending on the level of protection required, these self contained systems can include comprehensive, computer-grade support features such as cooling, power, monitoring and security — all integrated in a seamless, qualified design.

Liebert MCR

The **Liebert Foundation MCR** (Mini Computer Room) is an air conditioned cabinet with integrated UPS protection and cooling, designed to ensure the long-term viability of IT equipment. The load-sized, computer-grade air conditioner can be located at the top or bottom of the enclosure. A back-up cooling system ensures cooling security. Power protection is provided by a Liebert rack-mount UPS.

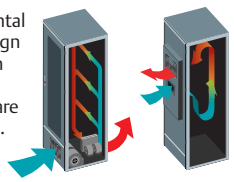
Features and Benefits

The capabilities and features of the Liebert Foundation MCR are designed to provide maximum protection for systems housed within the enclosure:

- **Comprehensive, integrated Liebert design** — combines computer-grade support systems, including cooling, power, monitoring and security into a single, pre-tested system.
- **Mobile design for quick deployment** — lets you put a self-contained mini-computer room right where you need it, today or tomorrow.
- **Agency approved as a system** — pre-qualified and ready for installation.
- **ECM (Environmental Control Module)** — computer-grade air conditioning load matched to UPS.
- **BCM (Back-up Cooling Module)** — provides cooling in the event of a power loss or can be utilized to reduce energy consumption with the BCM Energy Saver Control.
- **Liebert On-Line or Line-Interactive UPS** — provides back-up power protection.
- **Advanced power management** — Liebert Managed Power Advanced Power Strips are also available as an option to provide power control at the receptacle level.
- **Multiple monitoring options** — provide alarm and enclosure status monitoring.

Internal ECM

The integrated ECM (Environmental Control Module) - enclosure design promotes the best air circulation to prevent hotspots within the enclosure. Inside and outside air are isolated for maximum cleanliness.



Back-Up Cooling

During high internal temperature or power outage conditions, the BCM (Back-Up Cooling Module) — powered by the enclosure's UPS — is automatically activated, drawing in filtered outside air to ensure continuous air flow to protected equipment.

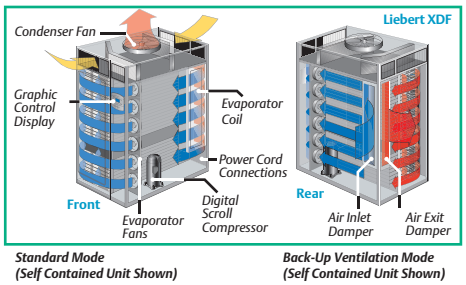
Liebert XDF

The air-cooled **Liebert XDF extreme density enclosure** is a fully self-contained plug-and-play rack-enclosure system that requires only AC power connection to create an integrated, mission-critical protection system for up to 36U and 14kW of sensitive electronics. 42U water-cooled unit exhausts the heat from the electronic equipment through the water piping circuit that is connected to an external dry cooler.

Features and Benefits

The Liebert XDF includes integrated high capacity cooling that provides the benefits of big room support in a cost-effective package. Advantages include:

- **Lower cost cooling** — the Liebert XDF uses a digital scroll compressor which is unique to Liebert and allows for continual and precise adjustments in cooling, resulting in lower energy costs.
- **Effective cooling** — optimized horizontal air circulation cools the protected equipment, both in standard mode and in the unique backup ventilation mode.
- **High level control** — control and monitoring are provided through a cabinet-mounted Liebert iCOM control system, providing local and remote access to monitoring of conditions within the Liebert XDF.
- **Quick deployment** — easily adaptable, plug-and-play installation. Self-contained air-cooled model requires only AC power connection.
- **Back-up ventilation—** Integrated automatic back-up ventilation.
- **Business-critical power protection** — provided through an optional Liebert GXT, a rack-mounted UPS that features on-line power protection, remote monitoring, an external maintenance bypass and extended battery runtimes.
- **Advanced power management** — Liebert Managed Power Advanced Power Strips are also available as an option to provide power control at the receptacle level.



Standard Mode (Self Contained Unit Shown)

Back-Up Ventilation Mode (Self Contained Unit Shown)

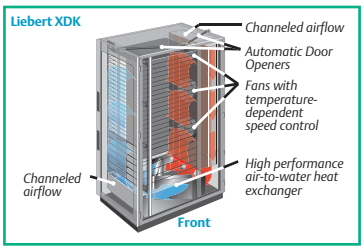
Liebert XDK-W

Another innovative solution for protecting high density applications is the **Liebert XDK-W** rack enclosure with integrated cooling. This proven enclosure solution creates a protective, space-saving environment for blade servers and other rack-based, extreme density IT equipment.

Features and Benefits

The Liebert XDK offers a number of unique features designed to provide high-level cooling protection of rack-mounted components:

- **Completely sealed from room air** — high density server racks inside the unit utilize closed air circulation for cooling.
- **Effective heat removal** — server heat load is dissipated into the cold water system through an air-to-water heat exchanger in the bottom of the rack.
- **Automatic front and rear door opener** — operates in case of overheating in the rack.
- **Redundant high-performance variable speed fans** — drive closed loop air circulation in the rack's interior, while servers are supplied with cold air at the front of the rack.
- **Can cool more than 25 kW of heat load in the rack** — reduces the risks of downtime in extreme density environments.
- **Highest packing density** for high-performance servers. Consequently, up to 80% floor space saving in the data center.
- **Highest possible leakage safety** — with strict separation of heat exchangers and electronic equipment.
- **Utilizes Liebert XDP-W Coolant Pumping Unit** — which houses the isolating heat exchanger between the Liebert XDK-W water circuit and the building chilled water, as well as the control valve, pumps and system controls. It controls the fluid temperature to always be above the actual room dewpoint to prevent condensation on the piping and the coils.

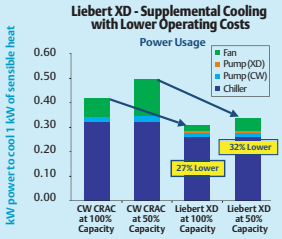


High Heat Density Solutions For Rack, Spot And Zone Cooling

Mission-critical heat removal systems can now be configured to target cooling directly at hot spots. Unique equipment designs also enable users to handle high heat loads without consuming additional floorspace.

Data Center Cooling Solution Starts With The Best

A Liebert DS Mission-Critical Cooling System provides basic cooling, humidity control and air filtration.



The smaller chiller plant and lower fan load result in significant energy savings. A 27% energy savings is very conservative.

The Liebert XD™ System Provides Supplemental Sensible Cooling For High Heat Density Racks Or Zones.

Product Features Include:

- Energy efficient.
- Can cool more than 30kW per rack.
- Pumped refrigerant solutions are ideal for use around electronic equipment.
- Minimal floorspace requirements.
- Flexibility to accommodate various equipment layouts.
- Scalable – add or move cooling modules as your needs change without the need for an HVAC technician.

Liebert XD™ Series Rack, Zone And Spot Cooling: Flexible Configurations For Many Applications

Pumped Refrigerant Approach

Pumped refrigerant
Pumped refrigerant technology is ideal for use around electronic equipment. It operates at low pressure in the piping circuit and would become a gas at room conditions. Use of pumped refrigerant also makes the system very energy efficient and it saves space with smaller piping requirements and the ability to utilize more compact heat exchangers.

A Chiller Designed For Direct System Configurations

The **Liebert XDC Chiller** is a specially designed indoor unit that connects directly to the Liebert XD Cooling Modules and provides chilled pumped refrigerant circulation and control. It ensures that the refrigerant is constantly above the actual dew point in the room, eliminating concern about condensation. Available with several heat rejection options.

Pumping Unit Designed For Indirect Configuration Applications

When a building chilled water system is available, the **Liebert XDP with iCOM Pumping Unit** serves as an isolating interface between the building chilled water system and the pumped refrigerant circuit. It circulates refrigerant to the XD Cooling Modules at a temperature always above the actual dew point to prevent condensation. Liebert XDP features Liebert iCOM controls, enhancing system reliability and flexibility.

The Overhead Cooling Solution

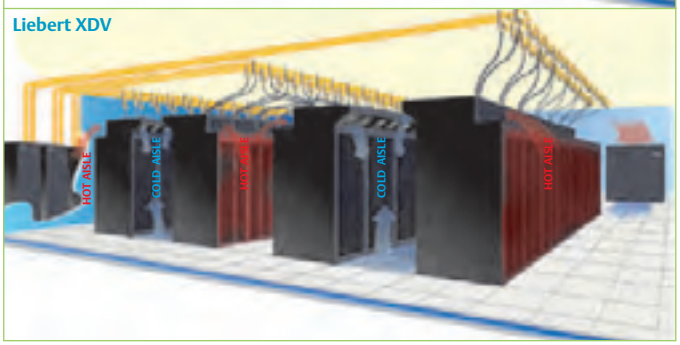
The ceiling-mounted **Liebert XDO Overhead Cooling Module** mounts directly above the cold aisle. It draws in hot air from the hot aisle and then discharges cool air into the cold aisle where the equipment air inlets are located. This energy-efficient unit takes up no floor space. Available with Smart Module integrated control board, for increased module control and monitoring.

Space-Saving Solution That Cools From The Top

The **Liebert XDV Cooling Module** mounts vertically above or on the IT rack enclosure, drawing hot air from inside the cabinet or from the hot aisle. It then cools the air and discharges it down to the cold aisle. This space-saving solution requires zero floor space. Available with Smart Module integrated control board, for increased module control and monitoring.

Liebert XDO

Liebert XDV



The Liebert XD units work extremely well with the hot aisle/cold aisle design of raised floor applications by efficiently drawing hot air out of equipment racks and moving cool air into the cold aisle.

Liebert XD Piping is pre-fabricated distribution piping that is installed in anticipation of a growing system. Liebert XD Cooling modules are then added, disconnected, or repositioned as required and are quickly made operational with flexible connection piping with quick-connect fittings.

Water-Cooled Approach

In-Row Cooling That's Right In Line With Your Needs

The modular **Liebert XDH Horizontal Row Cooler** is placed directly in line with rack enclosures. Air from the hot aisle is drawn in through the rear of the unit, cooled, and then discharged through the front of the unit into the cold aisle. The modular and adaptive design of the Liebert XDH allows it to be easily added as the demand for cooling increases. Available with Smart Module integrated control board, for increased module control and monitoring.

The Most Energy Efficient Cooling Available

Liebert XDR Rack Door Cooling Module replaces the back door of a server enclosure, providing cooling without increasing the rack footprint. The module uses the server fans within the protected rack to provide airflow, providing the most energy efficient design.

The Heart Of The Water-based System

The **Liebert XDP-W Coolant Pumping Unit** is the key to the performance, efficiency and space saving of the Liebert XDR-W RackCooler and Liebert XDK-W water-cooled rack enclosure. The unit houses the isolating heat exchanger between the Liebert XDR-W/XDK-W circuit fluid and building chilled water, the control valve, the dual redundant pumps and the system controls. It controls the fluid temperature to always be above the actual room dewpoint to avoid condensation. The Liebert XDP-W can be used with other brands of rack cooling equipment.

Liebert RackCooler

The **Liebert XDR-W Rack Cooler** utilizes a cooling unit that is attached to the back door of the enclosure. Fans in the module move air from the equipment in the rack, through a cooling coil and expel it from the back of the unit, chilled to the point where the impact on the room is close to neutral. This makes the Liebert XDR-W an ideal solution in applications where the hot aisle/cold aisle arrangement is not practical. The Liebert XDR-W can be configured to eliminate hot spots or uneven heat loads within the room.

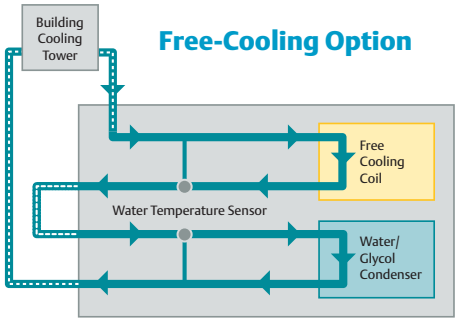
Overhead Cooling In A Variety Of Capacities And Configurations

Precision cooling and humidity control of small areas — such as computer, control and equipment rooms — is a lot easier thanks to the Liebert Mini-Mate2. Installed above a dropped ceiling to save valuable floorspace, the Liebert Mini-Mate2 is designed to fit into tight locations with front access on most units.

Available in 1, 1.5, 2, 3, 5 & 8 ton capacities, the Liebert Mini-Mate2's flexible design provides air distribution for direct supply/return (1-3 tons) or ducted applications (1-8 tons). It includes controls for temperature, humidification and dehumidification for year-round operation. Models are available with air-cooled, water/glycol-cooled, freecooling Econ-O-Coil or chilled water heat rejection systems.

Liebert Mini-Mate2 Product Features Include:

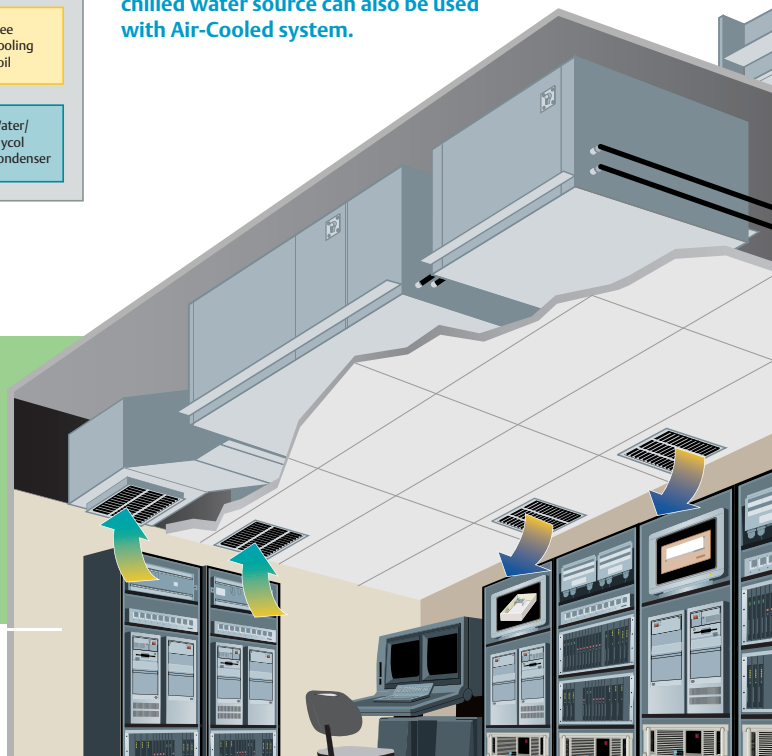
- Self-contained or split systems — allows for fitting systems with a variety of architectures.
- Reliable refrigeration components featuring rotary or scroll compressors and copper tube aluminum fin coils for high efficiency.
- Easy-to-use menu-driven microprocessor control. Optional room sensors available.
- 1-3 ton models with grille/plenum to fit 2'x4' ceiling grid for direct supply and return air distribution.
- Filter box, fan speed and/or blower options to handle ducted applications.
- Choice of hot water, stainless steel or stainless steel with SCR reheat.
- Hot gas bypass for low load applications.



Free-Cooling Option

When water temperature goes below 45˚F (7.2˚C), cooling switches over to Free-Cooling operation. A separate chilled water source can also be used with Air-Cooled system.

The components in units are located for easy service (1 ton self-contained unit shown)



Compact Indoor System Features Space Saving Design

Ideal for applications where people and sensitive electronics must occupy the same space, the Liebert DataMate provides 1.5, 2 or 3 tons of cooling capacity from a compact unit that requires little or no floorspace. Its low profile permits floor mount or wall mount installation, allowing more room for critical equipment.

Built with rugged components, the Liebert DataMate is designed to control temperature and humidity around-the-clock for year-round operation. The Liebert DataMate can manage the environment of smaller areas — or provide spot cooling in larger rooms. Models are available with air-cooled, water/glycol-cooled or chilled water heat rejection systems.

Liebert DataMate Product Features Include:

- Slim, low-profile design offers minimal floorspace and when wall-mounted, no floorspace is required.
- Easy to operate with the Liebert small systems microprocessor controller with LCD display.
- Low noise levels and upflow in distribution through direct drive centrifugal fan with automatic or manual speed selection.
- Self-contained or split systems — allows for fitting systems with a variety of architectures.
- Reliable refrigeration components featuring rotary or scroll compressors and copper tube aluminum fin coils for high efficiency.
- Easy-to-use menu-driven microprocessor control. Optional room sensors available.

A Complete Precision Air Conditioning System In Less Than Seven Square Feet

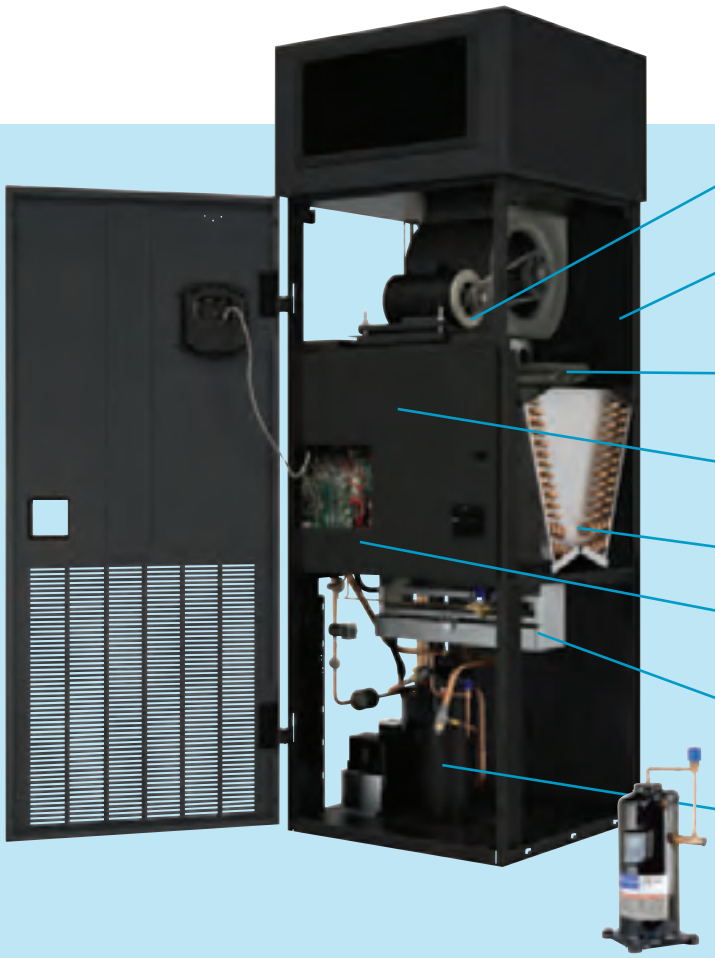
Designed to fit in the crowded confines of an equipment room or laboratory, the Liebert Challenger 3000 offers an extremely compact footprint for facilities where space is at a premium. This versatile unit is available in single circuit, self-contained or split systems to fit a variety of site plans.

All of Liebert Challenger 3000's critical components are accessible from the front, so the unit can be installed in a corner or flush against other equipment.

The Liebert Challenger 3000 provides complete environmental control, including temperature, humidity and air filtration. A choice of humidification control includes an infrared humidifier, to provide instantaneous water vapor, or a steam generating unit. Electric, SCR and hot water reheat options are also offered.

The Compact Liebert Challenger 3000 Is A Perfect Match For Many Critical Applications:

- Small data centers.
- Laboratories and medical imaging suites.
- Telecommunications switching facilities.
- Industrial process control rooms.


Vibration-Isolated Fan Deck
Corrosion-Resistant Steel Frame
Stainless Steel Finned-Tube Reheat
Housing For Two Liebert IntelliSlot Cards
A-Frame Evaporator Coil
Front Access For Easy Maintenance
Infrared Humidifier For Precise Humidity Control
Digital Scroll Compressor

Liebert Challenger 3000 Product Features include:

- 3 and 5 ton capacities.
- Reliable refrigeration components featuring scroll compressors, A-frame evaporator coils, all factory pre-piped, wired, and tested in a rugged, easy-access tubular-steel frame.
- Designed for upflow or downflow floor mounting in self-contained or split-systems.
- A choice of air-cooled, water/glycol-cooled, GLYCOOL™ Econ-O-Coil or chilled water heat rejection systems.
- Outdoor condenser, outdoor drycooler or indoor condensing unit options.
- Variety of filter efficiency options.
- Several motor/blower options to meet various CFM and ESP applications.

The Liebert Challenger™ 3000 Precision Cooling System Provides:

- Complete control of temperature, humidity and air filtration.
- An extremely compact footprint, ideal for facilities where space is at a premium.
- All front access for critical components, so the unit may be corner-installed or installed flush against other equipment.
- Advanced Liebert iCOM electronic controls for greater system efficiency.
- Choice of energy efficient compressors on self-contained systems.
- R407-C refrigerant, in compliance with government standards.

Liebert iCOM® Optimized System Performance

The standard **Small Graphic Display** offers a 128 x 64 dot matrix screen that simultaneously shows two menu icons, along with descriptive text. This display controls only the unit to which it is directly connected.

The optional **Large Graphic Display** features a 320 x 240 dot matrix screen that shows up to 16 menu icons at a time, as well as descriptive text. This display can be used to control a single cooling unit or any cooling unit on a network.

Intelligent, Efficient Precision Cooling For Data Center Equipment

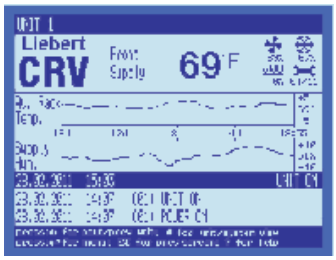
High energy costs, high density racks, floor space issues and other factors have made data center cooling more challenging than ever. The Liebert CRV delivers energy efficiency and value without compromising in terms of controls, reliability or flexibility. It is an ideal solution for dynamic environments where new equipment and technology is routinely added and removed, and there is need to continually adjust to changing business and IT demands.

This compact, self-contained precision cooling system installs within a row of data center racks — close to the server heat source — for the most efficient and effective cooling of critical IT equipment.

The Liebert CRV uses the latest technology digital scroll compressor and electrically commutated (EC) fans to deliver precise operation and enhanced efficiency. The compressor adapts to capacity changes from 20 to 100 percent without cycling on and off, while the EC fan speed adjusts to the IT load to provide the most efficient cooling possible.

The integrated Liebert iCOM® control provides advanced monitoring and modulates unit performance in real-time, based on conditions in the row. It also enables multiple Liebert CRV units to communicate and work together as a single system to precisely control temperature and humidity across a room while optimizing the efficiency of the entire cooling system.

Bar graphs show the inlet temperature of every rack with a 2T temperature sensor.



Line graphs show the historical temperature and humidity conditions for the past 8 minutes to 16 days.

Liebert iCOM® Control presents up to 11 temperature measurements and unit performance in an easy to understand graphical summary. Liebert iCOM controls offer a variety of advantages, including icon-based navigation, adjustable control algorithms, and data center monitoring capabilities.

2T Rack Sensors provide two temperature readings per rack to ensure the proper amount of cold air is provided to eliminate hot spots.

Adjustable Baffles direct airflow right, left or both directions, allowing you to easily change the airflow distribution as your cooling needs change.

Blue-tinted hydrophilic cooling coil disburses water quickly, preventing carryover of water into the cold aisle.

R-410A Refrigerant is environmentally friendly and meets the latest government standards.

Liebert IntelliSlot™ Communication Cards can be accessed without entering the high voltage panel and allow the system to communicate with remote infrastructure management systems.

Liebert CRV: Reliable, Flexible And Economical

Designed for hot-aisle/cold-aisle configuration, the Liebert CRV is available in 20 kW and 35 kW air-cooled or water/glycol-cooled systems, or a 40 kW chilled-water system.

The Liebert CRV Is ideal For Many Applications:

- Small to medium-sized data centers cold/hot aisle configurations.
- Heat density up to 10 kW/rack without containment.
- Raised and non-raised floors.
- Rooms with a low ceiling where air cannot be ducted.
- SmartAisle™ containment system.
- Spot cooling in large data centers.

Liebert CRV Product Features Include:

- Provides 24/7 precision environmental control: cooling, humidity control and air filtration.
- Adjustable airflow baffles maximize cooling to rack equipment, allowing the system to be positioned within the row or at the end of the row.
- Multiple units communicate with each other to improve system performance and reduce energy consumption.
- Up to 10 racks per cooling unit may be monitored to improve system performance and report rack temperatures.
- The Liebert iCOM large graphic display allows easy navigation and clear data display, including alerts for preventive maintenance.
- Variable speed fans, variable capacity digital scroll compressor and the advanced Liebert iCOM system control all work together to provide energy savings over traditional perimeter cooling systems.
- Only front and back access required, resulting in minimized installation and service time.
- Caster mounted for easy placement.

Variable EC Fans regulate airflow and reduce the fan input power; resulting in up to 50% less power used by the fans compared to traditional perimeter cooling.

High Performance Air Filters are easily accessed through the back of the unit.

Digital Scroll Compressor enables the variable cooling capacity to precisely match changing cooling demand without cycling on and off, reducing energy consumption and extending compressor life.

A Chilled Water Precision Cooling System That Handles The Most Demanding Conditions

Based on the historically reliable design of the Liebert Deluxe System/3, the Liebert CW continues this reputation for dependability, and improves upon the design with energy saving upgrades. The Liebert CW chilled water based precision cooling system is specifically designed to handle the high heat loads generated by computers and other electronic equipment, using an existing building chiller as a source of chilled water cooling.

Built to the highest specifications in the industry with proven components and design, the Liebert CW is ideal for critical applications including:

- Data centers
- Telecommunications central switching offices
- Industrial process control centers
- Laboratories
- Medical facilities

EC Plug Fans are available on all Liebert CW downflow models.
Shown in underfloor configuration.

Every Feature Contributes To Absolute Reliability

When the demand is for around the clock operation, you simply can't take shortcuts. Liebert CW is designed with robust components that operate reliably under the most demanding conditions, ensuring uptime for sensitive electronics in critical applications.

Fans And Motors

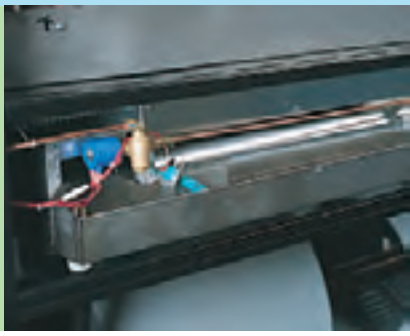
Clean, even air distribution is supplied by large capacity fans, which are balanced to minimize vibration. The fans draw filtered air through the system. EC Plug Fans are available as an option on all Liebert CW downflow models.

A-Frame Coil

This Liebert designed and manufactured A-Frame coil features a large face area/low face velocity design for maximum cooling and even air distribution.

Draw-Through Airflow

The fans draw air evenly and at low velocity through the cooling coil, reheat and humidification systems. The result is far less turbulence with superior efficiencies in heat transfer. Clean air at the right temperature and humidity is fed positively and evenly into the room.



Economical Chilled Water Systems

By taking advantage of your existing central air conditioning chiller, the Liebert CW provides thrifty, durable cooling and humidity control around the clock, throughout the year.

The Liebert CW chilled water system offers rugged, yet affordable cooling and humidity control where a central water chiller is available as a year-round cooling source. In these applications, a single chiller can be used for multiple air conditioning units, providing savings on additional heat rejection components.

The full line of Liebert chilled water systems use Liebert iCOM microprocessor-based controls to maintain precise temperature and humidity levels, while the cooling hardware is designed and built for continuous, trouble-free operation.

More Cooling Capacities

Available in ten cooling capacities, with either upflow or downflow configurations.

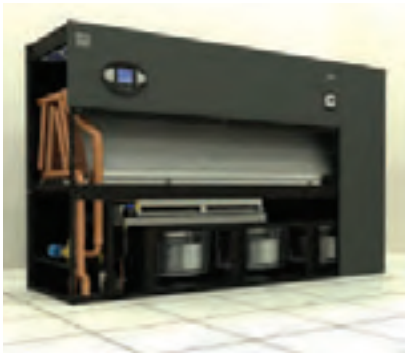
Chilled Water Control Valve

The chilled water valve provides proportional control action in response to room temperature and humidity as sensed by the microprocessor control. It includes operating linkage and electronic motor. Unlike other systems of this nature it requires no over-travel linkage or end switches to be adjusted. The control uses "intelligent logic" to eliminate valve hunting, thus greatly increasing the life of the valve. The valve can be a 3-way or 2-way to meet the appropriate requirements of the installed system.

Economizer operation

For economical, free-cooling operation, Liebert CW is compatible with the Liebert Air Economizer solution, and also works with Chiller Plant Series Economizer applications. Economizers can reduce operating costs by up to 50%, based on regional ambient conditions.

EC Plug Fans in underfloor configuration
(available on all Liebert CW downflow models)



EC Plug Fans in-unit configuration
(available on all Liebert CW downflow models)

Premium efficiency centrifugal fans, and optional Variable Speed Drive fan motors, are available on all models

All Liebert CW Downflow Models Are Now Available With Energy Efficient EC Plug Fans.

The energy saving capabilities of the Liebert CW with EC Plug Fans or variable speed drive fans result in a quick payback through lower electricity costs.

Designed To A Higher Standard Of Performance And Reliability

High performance, sensitive electronic equipment requires a highly regulated room environment for proper operation. Based on the proven design and cooling technology of Liebert Deluxe Systems, the Liebert DS provides precise control of temperature, humidity, filtration and airflow within the critical space. The flexible Liebert DS offers high energy efficiency, user-friendly iCOM controls, modular frame, front service access and compressor options. Available in 28-105kW (8-30 Tons) downflow and upflow models.

Built To The Highest Specifications In The Industry With Proven Components And Design, The Liebert DS Is Ideal ForCritical Applications Including:

- Mid to large data centers
- Telecommunications facilities
- Industrial process control centers
- Laboratories
- Other sensitive electronic applications

Liebert DS Downflow

Liebert DS Upflow

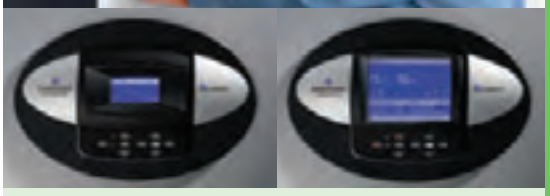
Liebert DS Product Features Include:

- Reliable refrigeration components featuring dual compressors, A-frame evaporator coils, all factory pre-piped, wired, and tested.
- Liebert iCOM control system for high-level supervision of multiple precision cooling units.
- Total front access for service.
- Modular frame construction for easy installation.
- Available Digital Scroll Compressors for ultimate capacity control and reliability.
- Energy efficient Variable Speed Drive fan motor option available on models with digital scroll compressors.
- Dual Cool energy efficiency option.
- Energy savings of up to 50% when downflow systems are used with the Liebert Air Economizer solution, or up/downflow systems use the GLYCOOL free-cooling option.
- Factory installed reheat, dehumidification and humidification.
- Air delivery system designed for optimized air distribution.
- Integral air filtration to protect against airborne contaminants within the critical environment.
- Flexible heat rejection configurations: air-cooled, water-cooled, glycol-cooled and GLYCOOL™ models can meet any installation requirement.
- Welded frame is coated using Autophoretic® process for a corrosion-resistant finish.
- Patented Paradenser™ condenser for use in water/glycol systems is fully cleanable to eliminate costly failures due to plugging and provides a longer service life.
- Utilizes environmentally-friendly R-407C refrigerant to meet future environmental standards.

Fully cleanable Paradenser tubes are located for convenient maintenance

A Choice Of Compressors Offers Higher Efficiency, Adaptability And Reliable Operation

Only Liebert offers you a choice of energy efficient compressor systems to suit your specific application and budget requirements.



Liebert iCOM Control System

The Liebert iCOM control system featured on the Liebert DS brings high-level supervision to multiple units, allowing them to work together as a single system to optimize room performance. The Liebert iCOM control system offers a variety of advantages:

- Saves Energy using Predictive Humidity Control.
- Built-in Lead/Lag Functions for enhanced system reliability.
- Wellness Calculation alerts service personnel before problems occur.
- Unit-to-Unit Communications allows Lead/Lag and optional teamwork settings for maximum flexibility of control.
- Removable display makes troubleshooting easier.
- Monitors all key system functions and reports to alarm, if needed.

The standard Small Graphic Display features a 128x64 dot matrix backlit screen. Advanced monitoring can be achieved with the addition of the Optional Wall Mounted Display.

The Standard Scroll Compressor: Rugged, Quiet,Efficient

The standard scroll compressor offers efficient, reliable performance with a robust design that contains only a few moving parts. Quiet operation is accomplished through a continual, smooth compression process. Discharge gas and vibration are kept at a low level.

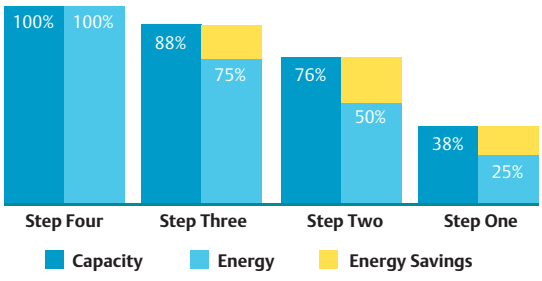
Optional Energy Saving Variable Speed Drive Fan Motor

Liebert DS models using digital Scroll compressors are also available with an optional variable speed drive on the fan motor used to drive centrifugal blowers. This feature matches the motor speed to the room cooling requirements, allowing the unit to use far less motor energy to move room air. This drive is controlled by the Liebert iCOM control system to match the speed of the blower with the load in the room. This option eliminates excessive energy use due to an oversized design or changing room conditions.

Four-Step Semi-Hermetic Compressors: Proven Performance

The Liebert DS Four-Step system achieves high levels of energy efficiency and reliability through the integration of two high-efficiency semi-hermetic compressors with capacity control valves, a microprocessor control system and a computer-optimized cooling coil. Four distinct stages of cooling are activated to more closely respond to changing room conditions. This reduces compressor cycling and energy consumption during periods of low room load conditions for enhanced service life and greater efficiency.

Energy Savings–Four-Step Semi-Hermetic Operation



U2U Configuration 2

Liebert DS units with Small Graphic Display may be centrally monitored and controlled with the Optional Wall Mounted Display.

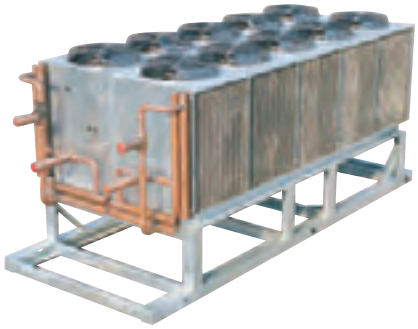
Teamwork: Mode 2

Units work together to provide precision cooling in rooms with unbalanced loads.

Reliable Heat Rejection To Match Many Conditions

Liebert manufactures its own line of air-cooled condensers and drycoolers that are precisely matched to the heat rejection requirements of our air conditioning and fluid chiller systems for any ambient temperature or altitude.

Liebert condensers and drycoolers are fully factory wired and tested for easy installation. Only electrical and refrigerant or glycol connections need to be made at the site. Constructed with an aluminum cabinet and a copper-tube aluminum-fin coil, these exceptionally dependable units are corrosion resistant and designed to operate for prolonged periods of exposure in the worst weather conditions. They are available in a wide range of capacities, as well as horizontal and vertical airflow configurations.



Liebert 10 Fan Drycooler

Liebert 2 fan Condenser

Liebert Condensers

The low-profile, direct-drive propeller fan type air-cooled condensers utilize either one or two separate circuits. Each balances the heat rejection of the corresponding compressor. Liebert air-cooled condensers are designed to maintain proper head pressures using variable-speed fans down to -20° F (-29° C) or Liebert Lee-Temp Head Pressure Control System down to -30° F (-34° C).

Liebert Drycoolers

Liebert drycoolers are designed for easy installation, uncomplicated service and maximum reliability. Featuring multiple methods for wintertime control, Liebert drycoolers are offered in a wide range of models to fit every application. Several pump packages are available.

Liebert's 10 fan drycooler is a spacesaving unit designed to provide heat rejection of 150 tons in a footprint of 123 square feet — 40 percent less space than required for two conventional 75 ton drycoolers.

Liebert Pump Packages

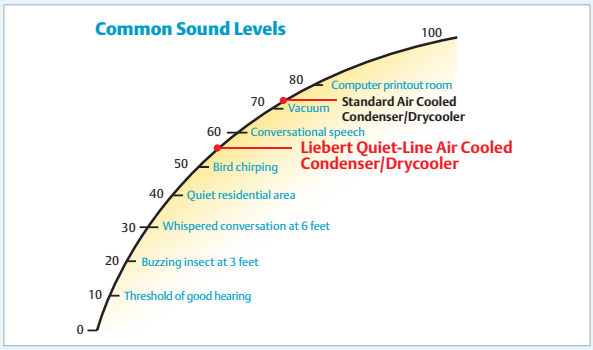
Standard Packages .75 to 7.5 hp single and dual pumps (piping shown optional). Non-standard Packages 7.5 to 50 hp in special fiberglass housings.

Liebert PB Series

Through the wall indoor heat rejection unit for those applications where outdoor heat rejection location is not practical, like high-rise buildings or areas with restricted access. Available with Lee-Temp head pressure control.

Quiet — And Even Quieter

All Liebert condensers are designed to operate at a minimal noise level. This is accomplished as the result of the Liebert fan blade design combined with a cabinet structure that minimizes air resistance. In applications where noise restrictions are a concern and further sound reduction is required, the Liebert Quiet-Line™ family of condensers and drycoolers offer levels as low as 57 dBA. Designed for outdoor installation, these units reduce unit operating noise even further through the use of lower speed motors and a larger coil surface.



For very low noise applications, the Liebert Quiet-Line models achieve additional sound reduction with slow speed motors (570 rpm).

Data Center Efficiency Management Platform

Reduce energy consumption while supporting higher density IT and networking equipment — without compromising your requirement for availability.

SmartAisle™, from Emerson Network Power, is a platform of technologies designed to optimize the efficient, design and operation of your data center infrastructure. SmartAisle can be installed at any location in the data center with multiple rack configurations.

The heart of the SmartAisle system is the unique Liebert iCOM control system that dynamically optimizes the operating parameters of your precision cooling environment.

SmartAisle is Ideally Suited For:

- Hot aisle/cold aisle applications.
- Raised floor data centers with perimeter cooling.
- Non-raised floor data centers using row-based precision cooling systems such as Liebert CRV or Liebert XD.
- Retrofit to existing racks.

Configure Smartaisle To Maximize Energy Efficiency And System Availability:

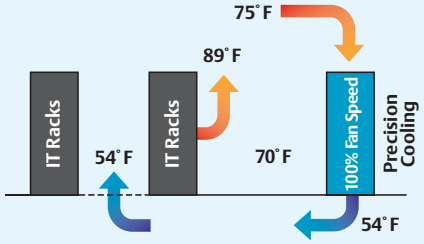
- Liebert iCOM control.
- Temperature and airflow sensors.
- Knurr DCM cabinets.
- Plexiglass roof panel system/containment curtain.
- Sealed entry doors.
- Liebert Precision Cooling systems.
- Roof-mounted wiring module.

SmartAisle is Designed To:

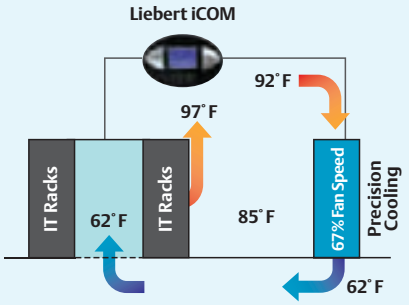
- Optimize Cooling System Efficiency.
- Eliminate Hot/Cold Air Mixing.
- Increase Space Efficiency.
- Increase Capacity.
- Allow Easy Retrofit.
- Leverage Redundancy/Availability.
- Provide Fast Return on Investment (ROI).

Measurable Energy Efficiency

Traditional Operation



SmartAisle With Integrated Containment:



- Requires less fan power per kW of cooling.
- Leverages variable fan speed control.
- Operates with digital scroll technology for variable capacity control.
- Provides continuous dynamic adaptation to cooling load.
- Allows you to easily take advantage of free cooling designs.

Environmental System Monitoring: The Key To Continuous Operation

The reliability of your computing and communications systems will be a direct result of the reliability of the environmental systems that help maintain their proper operation. This requires monitoring of these support systems as assurance that vital functions will continue without interruption.

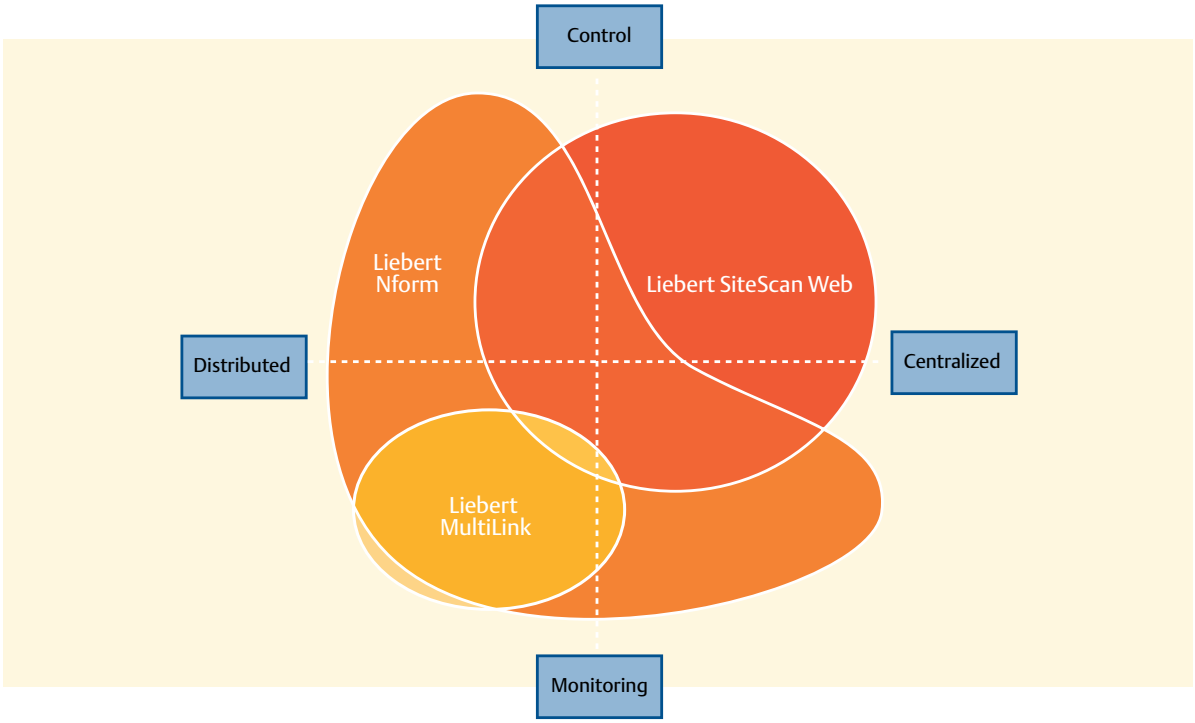
What You Don't Know Can Hurt You

A small problem in a critical facility can quickly escalate into a disaster — knowing what is happening with your support equipment, so you can keep that protective "envelope" at peak operating efficiency, is vital to system reliability. Liebert offers full-scale monitoring and control of critical support systems by providing the ability to gather operating information from each piece of equipment and pull it together in one central location.

Different People Need To Know Different Things

Liebert offers you more monitoring solutions than anyone else because getting the right information about your support equipment to the right people — with the right level of urgency — is so important to system availability.

We do this by allowing you to receive and use information from your Liebert equipment's microprocessor controls... no matter where it is located or what communications protocol, operating platform or building management system is being used. In-band, out-of-band and web-based monitoring are all available. From enterprise monitoring systems to individual pieces of communications hardware, you will know the exact problem so that you can implement the right solution.



Let Us Watch It For You

Continuous remote monitoring of environmental equipment and other facility systems is also available from Liebert through our Customer Response Center. This capability provides 24 x 7 watchdog service through an environmental site management program designed to meet your precision air conditioning equipment service requirements. It not only reports site problems, but initiates immediate action using a predetermined customer response plan — including access to factory-trained Liebert Global Services technicians who are quickly dispatched to your location when service is needed.

Maximizing Your Investment Through Adaptive Monitoring

Distributed Management With Liebert IntelliSlot Interface Cards

For enchanced remote communications and control of your Liebert units, the Liebert IntelliSlot Web and 485 Cards deliver the communication capabilities you require.

Monitoring and control through your existing Network with no additional software required.

Each Liebert system equipped with an Liebert IntelliSlot Web Card takes full advantage of your Ethernet network, allowing remote monitoring from your computer desktop, network operations center or wherever network access is permitted, without the need for front-end software.

Monitoring integration with your existing Building Management System.

A Liebert system equipped with an IntelliSlot™ 485 Card can be seamlessly integrated with your existing Building Management System.

Centralized Management With Liebert Nform™ Software

As business grows, your critical equipment infrastructure will expand, thus the need for centralized management of this equipment will be key to your business success. Connecting to equipment in the distributed critical space is only part of the monitoring challenge.

Liebert Nform leverages the network connectivity capabilities of your Liebert equipment to provide a centralized monitoring view of your distributed equipment.

Utilizing the SNMP and Web technologies built into each of the Liebert IntelliSlot communication cards, Nform will centrally manage alarm notifications to provide you with an easy interface to access critical status information. Liebert Nform puts critical systems information at the fingertips of support personnel—wherever they are—increasing responsiveness to alarm-event conditions, thus allowing IT organizations to maximize their system availability.

Enterprise Management With Liebert SiteScan® Web Software

For customers who require extensive management of critical system equipment that may span multiple locations in an ever-moving global enterprise, Liebert SiteScan Web will centrally manage your critical equipment and give you the power to move beyond the event-responsive service paradigm.

SiteScan Web does it all —

- **Real-Time Monitoring and Control**
- **Event Management and Reporting**
- **Data Analysis and Trending**
- **Building Management Integration**

Liebert SiteScanWeb is a comprehensive critical systems management solution dedicated to ensuring reliability through graphics, event management and data extrapolation. The standard Web interface allows users easy access from anywhere at anytime.

- Single and multi-site applications.
- Event management and unit control.
- Trend and historical data captures and reporting.
- Full ASHRAE BACnet compatibility.
- Java based.
- Windows 2000, XP and 2003 compatible.

Liebert IntelliSlot Web

Liebert Nform

Liebert SiteScan Web

From Design To Final Assembly... Here's What Makes The Difference

Everything we do is focused towards you...the customer. The Liebert design and manufacturing philosophy covers every aspect of the product from advanced engineering...to providing detailed equipment drawings...to manufacturing quality in our ISO 9000 certified production facilities...to assuring on-time delivery. We want you, your consultants and your contractors to depend on Liebert and our ability to always meet your needs from start to finish.

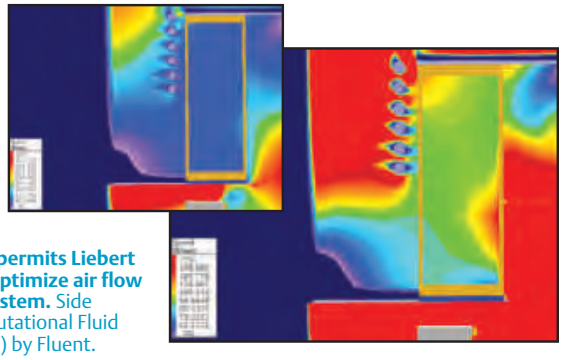
Whatever It Takes To Meet The Needs Of Our Customers

Liebert utilizes state-of-the-art tools, including advanced computer-aided design and simulation tools, to constantly refine the design of our products, including:

Solid Edge™ — a CAD/CAM system that utilizes 3D technology to reduce design times and improve product quality.

CFD™ — software that is designed to calculate airflow, heat transfer and contamination distribution by simulating building heating and ventilation systems. It employs the techniques of computational fluid dynamics (CFD) in order to address the design and optimization of these systems.

We also offer other resources and tools to help create the right product solution. Our Special Features Authorization capability allows cost-effective customization. Submittals and guide specs help you select the right system configuration. Comprehensive literature and technical manuals make sure that you have the most complete and up-to-date information on the operation of your Liebert product.



CFD software permits Liebert engineers to optimize air flow within each system. Side views of Computational Fluid Dynamics (CFD) by Fluent.

Manufacturing for durability — Control over manufacturing process is your assurance of product durability and performance.

Coil manufacturing — We are the only company in our business that makes its own coils to assure quality.

Autophoretic coating of frames — Assures complete coverage for maximum corrosion protection.

It's important to know that whether it's scheduled preventive maintenance...or an emergency situation, service support will be quickly and expertly handled.

Making Sure You Always Get The Right Solution

There are many places where Liebert equipment is vital — such as computer rooms, telecommunications centers, high density Internet hosting sites, colocation facilities and industrial control rooms. Our application engineers are experienced in all of these situations and can make sure you always get a cooling solution that is tailored to your exact needs. To help maximize the performance and energy efficiency of the unit selected, they also utilize tools such as Coolsim and 6-Sigma, simulation software packages for the improvement of airflow distribution in data centers.

Testing To Always Be The Best

Full scale analysis and evaluation of our air conditioning products during all phases of development and production is your assurance of the most advanced performance and highest quality.

A Company-Wide Commitment To Excellence

Our employees take great pride in the products they build. Liebert products are manufactured under the stringent manufacturing and quality control processes of ISO 9000 certification, using the latest computer-controlled equipment. All phases of production are carefully monitored and controlled.

Someone There To Help Keep You Up And Running

After you purchase your Liebert precision cooling system, there will always be someone who can answer any questions or operational problems you may have.
We are committed to providing comprehensive service training programs to all of our service engineers and technicians. Liebert's service capabilities, including preventive maintenance programs, can increase the availability of your precision cooling equipment by reducing downtime due to component failure. This is especially valuable to companies who do not have a dedicated technician on-site to troubleshoot equipment.

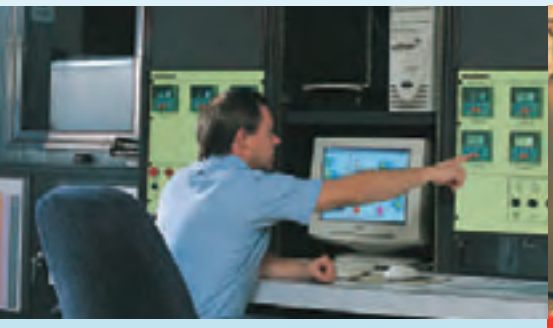
Building Code Approvals Made Easy

Our standard 60Hz products are CSA c-us certified and meet both U.S.A. and Canadian government safety standards, providing fast, hassle-free inspection and building code approvals.

ISO 9000 CERTIFIED COMPANY

C SA US

Powder coated exterior panels — Solvent-free process provides a durable, high quality, scratch-resistant finish.



Our state-of-the-art psychrometric laboratory allows us to test units under a wide variety of temperature and humidity conditions. 60-Ton capability is the largest in our industry.

Quality maintained along full production line — over 400 check points along the way.

Final testing — Your assurance that everything is done right.

Precision Cooling Solutions To Keep You Up And Running

Emerson Network Power offers more ways to handle your Liebert precision cooling maintenance and emergency service requirements than any other source. Service and support specialists are located everywhere you need them to be.

The Best Coverage In The Business

Field service is provided by Liebert Services technicians augmented with The Liebert Service Partner Network™ — a nationwide network of locally-based service partners, with factory-trained technicians that handle service support and maintenance of Liebert precision cooling products. Warranty inspection at the time of start-up by these technicians can ensure proper operation and tune the performance of the unit to the application. This can be instrumental in assuring a long unit life.

The variety of service offerings includes warranty service, emergency service, preventive maintenance and professional services. We offer 24 x 7 x 365 emergency dispatch service through our Customer Resolution Center. This facility provides immediate access to factory-trained technicians, located within your own area, who are quickly dispatched to your location when service is required. Preventive maintenance solutions provide you with a choice of coverage options — each designed to meet your specific support requirements. These offerings are ideal for those who require the peak operating efficiency, reliability and uptime that only a comprehensive maintenance program can deliver.

We also offer a site management program that creates a customized service package for your operation by offering a single point of contact for all your service needs. It gives you a proactive action plan to provide operational support and guidance for your critical facility.

Additional Service Offerings That Make A Difference

Liebert Services can also help to improve your data center performance and energy efficiency.

- Enterprise remote monitoring.
- Liebert iCOM controls networking/upgrading.
- Thermal assessments and CFD modeling.
- Energy efficiency assessments.

Remote Monitoring

Enhance your data center reliability and visibility with comprehensive alarm management, diagnostics and response services that are tailored to your specific needs. For both flexibility and reliability, we can monitor via the Web or through dial-up. By using network interface cards, we provide significantly more alarm types for diagnostics. And our Customer Resolution Center is ready to respond as soon as an alarm occurs.

Our ability to poll your equipment's operational data at regular intervals provides unsurpassed predictive maintenance capabilities. Certified technicians analyze your data, identifying issues before they become problems and maximizing availability.

Full Service And Preventive Maintenance Programs For Precision Cooling Equipment

Service Program	Guaranteed 4 hr Response	Emergency Service	Preventative Maintenance	Prev. Maintenance Schedules	Service Description
Preferred PM's 7x24	7 Days 24 Hours	Parts, Labor & Travel 7 Days 24 Hours	7 Days 24 Hours	Choose 2 or 4 or 8 Preventative Maintenance visits per year	Preferred Service (8) PM's per year 7x24 Preferred Service (4) PM's per year 7x24 Preferred Service (2) PM's per year 7x24
Essential PM's 8x5	7 Days 24 Hours	Parts, Labor & Travel 7 Days 24 Hours	M through F 8:00 am - 5:00 pm	Choose 2 or 4 or 8 Preventative Maintenance visits per year	Essential Service (8) PM's per year 8x5 Essential Service (4) PM's per year 8x5 Essential Service (2) PM's per year 8x5
PM Only 7x24	7 Days 24 Hours	Billable	7 Days 24 Hours	Choose 2 or 4 or 8 Preventative Maintenance visits per year	Maintenance with belts & filters (8) PM's per year 7x24 Maintenance with belts & filters (6) PM's per year 7x24 Maintenance with belts & filters (2) PM's per year 7x24 Maintenance only (8) PM's per year 7x24 Maintenance only (4) PM's per year 7x24 Maintenance only (2) PM's per year 7x24
PM Only 8x5	7 Days 24 Hours	Billable	M through F 8:00 am - 5:00 pm	Choose 2 or 4 or 8 Preventative Maintenance visits per year	Maintenance with belts & filters (8) PM's per year 8x5 Maintenance with belts & filters (6) PM's per year 8x5 Maintenance with belts & filters (2) PM's per year 8x5 Maintenance only (8) PM's per year 8x5 Maintenance only (4) PM's per year 8x5 Maintenance only (2) PM's per year 8x5
Basic PM's 8x5	7 Days 24 Hours	Labor Only 7 Days 24 Hours	M through F 8:00 am - 5:00 pm	Choose 2 or 4 Preventative Maintenance visits per year	Basic Service (4) PM's w/ B&F per year 8x5 Basice Service (2) PM's w/B&F per year 8x5
Basic PM's 7x24	7 Days 24 Hours	Labor Only 7 Days 24 Hours	7 Days 24 Hours	Choose 2 or 4 Preventative Maintenance visits per year	Basic Service (4) PM's w/ B&F per year 8x5 Basice Service (2) PM's w/B&F per year 8x5

Liebert: The World Leader In Mission-Critical Power And Cooling Technologies

High Heat Density And Precision Cooling

Power Availability And Protection

Integrated Racks And Cabinets

Power Conversion And Distribution

Monitoring And Communication

You Know About Our Complete Line Of Environmental Control Systems

From high-capacity mission-critical cooling systems — to compact and above-ceiling units — to our targeted cooling products designed for the demanding requirements of high density electronic installations... there is a Liebert solution designed to cool and protect your critical computing and communications equipment. We make the industry's widest range of mission-critical environmental control, including air conditioners, fluid chillers and heat rejection systems from 1.0 to more than 60 tons, in a variety of configurations and cooling technologies.

Liebert Offers A Full Range Of Power Protection Solutions

A steady flow of power, and the means to get it to each piece of equipment in a critical facility, is a key to systems reliability. The proper functioning of these systems depends on the quality of power and the ability to ride through outages of any duration. Only Liebert offers the breadth of power supply products to meet any of these needs.

- **Power availability** solutions include uninterruptible power supply (UPS) systems from 300 VA to over 1000 kVA.
- **Power protection** products include surge protection and power conditioning systems up to 300 kVA.
- **Power conversion and distribution** systems for both AC and DC power applications range from 15 kVA to 225 kVA.

Liebert Integrated Racks And Cabinets — Protection Wherever It's Needed

Rack-based equipment has formed the foundation of today's IT network. To house and protect these systems, Liebert offers a complete line of rack, cabinets and integrated protection enclosures for rack-mounted components. From open racks employed in large data centers to self-contained, integrated enclosures with cooling and power protection used in remote locations, there is a Liebert rack solution for every application.

Monitoring Solutions From Liebert — The Smart Decision To Make

Liebert is the only source that supplies the protection infrastructure and all the tools you need to know how it is operating every minute of every day.

From one-on-one supervision of a single piece of equipment to full-scale monitoring and control of several far-flung facilities, no one knows more about what it takes to keep you in the know about your critical systems than Liebert.

Ensuring The High Availability Of Mission-Critical Data And Applications.

Emerson Network Power, a business of Emerson (NYSE:EMR), is the global leader in enabling *Business- Critical Continuity™* from grid to chip for telecommunication networks, data centers, health care and industrial facilities. Emerson Network Power provides innovative solutions and expertise in areas including AC and DC power and precision cooling systems, embedded computing and power, integrated racks and enclosures, power switching and controls, monitoring, and connectivity. All solutions are supported globally by local Emerson Network Power service technicians. Liebert AC power, precision cooling and monitoring products and services from Emerson Network Power deliver Efficiency Without Compromise™ by helping customers optimize their data center infrastructure to reduce costs and deliver high availability.

Emerson Network Power
Liebert Corporation
World Headquarters
1050 Dearborn Drive
P.O. Box 29186
Columbus, Ohio 43229
United States Of America
800 877 9222 Phone (U.S. & Canada Only)
614 888 0246 Phone (Outside U.S.)
614 841 6022 FAX

Emerson Network Power
European Headquarters
Via Leonardo Da Vinci 8
Zona Industriale Tognana
35028 Piove Di Sacco (PD)
Italy
39 049 9719 111 Phone
39 049 5841 257 FAX

Emerson Network Power Asia Pacific
29/F, The Orient Square Building
F. Ortigas Jr. Road, Ortigas Center
Pasig City 1605
Philippines
+63 2 687 6615
+63 2 730 9572 FAX

liebert.com

24 x 7 Tech Support
800 222 5877 Phone
614 841 6755 (outside U.S.)

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- Connectivity
- DC Power
- Embedded Computing
- Embedded Power
- Infrastructure Management & Monitoring
- Outside Plant
- Power Switching & Controls
- **Precision Cooling**
- Racks & Integrated Cabinets
- Services
- Surge Protection

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